



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,820	01/17/2002	Zheng Yi Wu	107051-0001C1	4024
24267	7590	06/30/2006	EXAMINER	
CESARI AND MCKENNA, LLP 88 BLACK FALCON AVENUE BOSTON, MA 02210			SILVER, DAVID	
			ART UNIT	PAPER NUMBER
			2128	

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,820

Applicant(s)

WU ET AL.

Examiner

David Silver

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>apr 27 2006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-14 were originally presented for examination.
2. Claims 1-14 were rejected.
3. Claims 15-22 were added by Applicants.
4. Claims 1-22 are currently pending in Instant Application.
5. The Instant Application is not currently in condition for allowance.

Priority

6. Priority is not given to objected-to new subject matter recited below in section entitled "Response: Amendments".

Information Disclosure Statement

7. The information disclosure statement(s) (IDS) submitted on 4/27/06 is/are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement(s) is/are being considered by the examiner.
8. The following IDS entries previously submitted are not considered with respect to the instant amendment and remarks because the publication dates of the references are after the priority date of the Instant Application:
 - 8.1 Wu, Zheng Yi et al., Calibrating Water Distribution Model Via Genetic Algorithms, April 14-16, 2002, AWWA IMTech Conference, Kansas City Missouri, all pages.
 - 8.2 Wu, Zheng, Optimal Capacity Design of Water Distribution Systems, May 19: 2002, ASCE Annual Environmental and Water Resources System Analysis (EWRSA) Symposium, all pages.
 - 8.3 HARDING, et al., Back to MIKE NET Support Forum, (...), Boss International, 2003, pp. 1-4
 - 8.4 WALSKI, et al "Back to MIKE NET Forum", (...), Boss International, 2003 pp. 1-9
 - 8.5 Art submitted for consideration with a publication date after the priority date was not considered with respect to the instantly filed remarks and amendments.

Response to Arguments

9. The response to the Applicants' arguments are enumerated below.

Response: Abstract Objection

10. The Examiner thanks the Applicants for amending the abstract. The objection to the abstract has been withdrawn.

Response: Drawings

11. The drawings were received on 3/1/06. These drawings are acceptable.

Response: 1.105 Requirement for Information

12. The Examiner thanks the Applicants for partially submitting the required information.

12.1 WaterCAD versions 1 and 2 were not supplied by Applicants.

12.1.1 Applicants however have stated that these versions cannot be located.

12.1.2 This is considered a complete response with respect to the 1.105 Requirement for Information.

Response: 35 USC 101 Rejection

13. The Examiner thanks the Applicants for amending claims 10-14 in response to the 35 USC 101 rejection. The 35 USC 101 rejection has been withdrawn.

Response: Anticipation / Obviousness

14. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection as necessitated by amendment.

Response: Amendments

The amendment filed 4/27/06 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Claim 2: any of the "objective functions", limitations (B) and (C).

Claim 3: limitations (A), and (B) are not supported. Specifically, the specification does not discuss normalization.

Claim 10: (A)-(D): groups; (D): saving information is not disclosed

Claim 11: in its entirety

Art Unit: 2128

Claim 12: the amended portion

Claims 16: computing the mentioned multipliers

Claims 17: in its entirety – for example, limitation 2 discusses fire hydrants. Fire hydrants however are not discussed in the specification. This is merely exemplary.

Claim 18: in its entirety

Claim 19: in its entirety – for example, claim 19 discusses outputting data in a tabular setting. This however is not disclosed by the specification.

Claim 20: in its entirety – for example the correlation graph and hydraulic gradeline

Claim 21: in its entirety

Claim 22: in its entirety

15. Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

16. Claim 10 is objected to for a minor informality:

16.1 Lines 9-10: The phrase “a calibration module formatted to produces” presents a grammatical error.

16.2 Line 21: recites “and or more”. Seems the word “or” was placed in a minor oversight.

16.3 Line 21 recites “a weighting functions”. This presents a grammatical error.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

17. Claim 1-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the **written description requirement**. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the

Art Unit: 2128

inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not disclose the following material in order to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention:

Claim 1: The Specification does not disclose: How the objective functions are used, what the distance of an observed value and a simulated value means, how to use the two conversion factors function, what is a fitness entry and how it is assigned into the genetic algorithm.

Claim 2: The Specification does not disclose: objective functions, "the sum", how the minimization performed, what "the distance" is. The specification further does not disclose: in the objective functions... what difference is being minimized? what "a point per unit pressure head difference" is and what a "point per unit flow difference" is. It further does not disclose what a "a point per unit" is.

Claim 3: The Specification does not disclose: how the normalization performed, the normalization weighting factor.

Claim 10: The Specification does not disclose: (D): how the information saved, where information saved, how the calibration module is "formatted", a "a weighting functions", demand group and a roughness groups.

Claim 11: The Specification does not disclose: how multiple calibration runs are created, how they are using previous calibration runs as basis for the new calibration runs.

It is further noted that the parent-child relationship is contradictor to the Applicants' disclosure (**See, page 9 lines 17-23**), which discloses plurality of trials being generated at once then simulated one by one.

Claim 12: What is a "top solution"? How is the data saved?

Claim 16: What is a roughness multiplier and how is it calculated? What is a demand multiplier and how is it calculated?

A "link status" is either open / closed (**See Specification page 9 lines 13-14**). The specification

Art Unit: 2128

does not disclose how the status is computed?

Claim 17: The Specification does not disclose: how the collection of calibration boundary conditions is taken from a fire hydrant, how the pressure is taken at any location in the system. The specification further does not disclose: fire hydrant test pressure.

Claim 18: The Specification does not disclose: stopping criteria and how is it implemented?

Claims 19-22 are **not disclosed by the specification** in an adequate manner. For example, claim 19's outputting data in a tabular setting is not disclosed.

The specification is deficient because it fails to address the above-recited issues for the Instant Claims.

18. Claims 1-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the **enablement requirement**. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Note the reasons provided for claims 1-22 in the 35 USC 112, first paragraph written description requirement rejection above. The claims do not enable one of ordinary skill to make and use the invention without undue experimentation because the claims do not enable the deficiencies recited above.

19. Claims 1-22 are rejected under 35 U.S.C. 112, second paragraph, as being **indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

19.1 The following claims and their corresponding claim limitations do not have sufficient antecedent basis or suffer from ambiguities that render the claims indefinite:

Claim 2: "the sum", "the difference", "the distance" are lacking antecedent basis; "overall" is ambiguous.

Claim 3: "said weighting factors" lacks antecedent basis.

Claim 10: "selected field data sets" (antecedent); "and or more" (indefinite).

Claim 11: "settings", "the previously selected calibration settings" are lacking antecedent basis; apparent

Art Unit: 2128

(ambiguous).

Claim 12: "the end" lacks antecedent basis; "all calibration settings", "any calibration" are ambiguous. Furthermore, computer have a limited amount of memory and at a certain point there will be no more space to store new information. At this point one of two things will to happen: (1) system stall / crash (2) old memory is purged. If the Applicants system will stall / crash then a 35 USC 101 rejection will be given because the invention is not concrete. If the Applicants' system will purge old memory then the statement "user can review and retrieve any calibration run previously performed" will not be enabled. The above-principle is derived from the Pigeonhole Principle.

Claim 15: "the operational status" lacks antecedent basis.

Claim 16: "link status" is ambiguous - is the link status computation referring to the link status of claim 1, or another instance of link status?

Claim 17: "the calibration one or more of" (emphasis added) is ambiguous. Specifically, it is referring to "calibration target data"? The term "in a system" fails to set the metes and bounds of the claim; "overall" is ambiguous; "any given" is ambiguous.

Claim 21: "selected top solution" lacks antecedent basis; the claim recites "The system as defined in claim 10 further comprising means for exporting any selected top solution as a scenario into said hydraulic module, which includes one or more of the following data sets: ..." it is ambiguous whether the data sets belong in the "top solution", "the system", or the "hydraulic module".

Claim 22: "the sum", "the difference", "the distance".

19.2 The following claims and their corresponding claim limitations are a relative terms which render the claims indefinite. The terms are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention.

Claim 2: "equivalent"; "overall".

Claim 10: "top solution" / "top trial solution" what is a "top" solution?

Art Unit: 2128

Claim 12: "top solutions"; "persistent".

Claim 17: "complete set"; "overall".

Claim 20: "top solution".

20. Claims not specifically mentioned are rejected by virtue of their dependency.

21. Applicants are required to fix all other similar occurrences of the above-cited deficiencies.

22. When correcting enablement / written disclosure deficiencies, Applicants are required to support their arguments with the portion of the Specification which provides support for the claim limitations in question.

Claim Interpretation

23. Link status defines whether a link is open or closed. This is identical to pipe flow being zero or non-zero. As such, link status is an inherent property of pipe flow. Any art teaching pipe flow inherently teaches link status.

24. Claim 10 line 21 recites "and or". This is interpreted as "and".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

25. Claims 1, 4-5, 7-9, 15-17, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Walters's "Calibration of water distribution network models using genetic algorithms", 1998 (submitted by Applicants in IDS dated 2/1/2006).

As per claim 1, Walters discloses: A method of automatically calibrating a water distribution model of a water distribution network, including the steps of:

(A) selecting calibration parameters including link status and one or more of pipe roughness, and junction demand (**Abstract. Note Claim Interpretation above, page 139 last para ... valve**);

Art Unit: 2128

(B) collecting field observed data including a pipe flow measurement and a junction pressure measurement for at least one point in the water distribution network, and including corresponding loading conditions and boundary conditions that existed in the network when said field observed data was collected **(page 135 last 2 paragraphs)**;

(C) generating a population of trial solutions that comprise a set of calibration results, using a genetic algorithm **(page 132 para 3)**; and

(D) running multiple hydraulic simulations of each trial solution to obtain a set of predictions of pipe flows and junction pressures at selected points in the network, corresponding to the different loading conditions and associated boundary conditions when the field observed data was collected **(Abstract; page 132 para 1-3 (emphasis on para 3), page 135 para 2)**.

As per claim 4, Walters discloses: The method of automatically calibrating a water distribution model, as defined in claim 1, including the further step of:

selecting as said loading condition, at least one water demand loading at a predetermined time of day, corresponding to a time of day when a field observed data measurement has been made **(page 135 para 2 and last para, page 137 section 4.4 para 3)**.

As per claim 5, Walters discloses: The method of automatically calibrating a water distribution model, as defined in claim 4, including the further step of selecting multiple loading conditions representing demand loading at various times of day when field observed data measurements have been made **(page 135 para 2 and last para)**.

As per claim 7, Walters discloses: The method of automatically calibrating a water distribution model as defined in claim 1 including the further step of:

after said optimized set of calibration data is obtained, making manual adjustments to this information for said water distribution model calibration **(page 134 para 3, abstract, page 135 para 2 and last para)**.

As per claim 8, Walters discloses: The method of automatically calibrating a water distribution network model as defined in claim 1, including the further step of performing a sensitivity analysis by varying

Art Unit: 2128

model input parameters over a predetermined range and observing the response thereto of said model
(page 134 para 3).

As per claim 9, Walters discloses: The method of automatically calibrating a water distribution network model as defined in claim 8 including the further step of adjusting the collection of field observed samples based upon the results of said sensitivity analysis **(page 134 para 3).**

As per claim 15, Walters discloses: A method as described in claim 1 wherein link status includes the operational status being opened or closed of one or more of pipes, valves and, as being on or off for pumps, in the water distribution model of the water distribution network that is being calibrated
(Abstract. Note Claim Interpretation above, page 139 last para ... valve).

As per claim 16: Walters discloses: The method as defined in claim 1 further comprising the step of: computing a roughness value, roughness multiplier, demand multiplier and link status **(Abstract, page 134).**

As per claim 22, Walters discloses: 22. (New) A method of manually calibrating a water distribution model of a water distribution network, including the steps of:

(A) selecting calibration parameters including link status and one or more of pipe roughness and junction demand **(Abstract. Note Claim Interpretation above, page 139 last para ... valve);**

(B) collecting field observed data including a pipe flow measurement and a junction pressure measurement for at least one point in the water distribution network, and including corresponding loading conditions and boundary conditions that existed in the network when said field observed data was collected **(page 135 last 2 paragraphs);**

(C) running multiple hydraulic simulations of each trial solution to obtain a set of predictions of pipe flows and junction pressures at selected points in the network, corresponding to the different loading conditions and associated boundary conditions when the field observed data was collected **(Abstract; page 132 para 1-3 (emphasis on para 3), page 135 para 2);**

(D) computing a goodness of fit value for each calibration solution by using one or more of the following objective functions **(goodness of fit ... fitness on page 133 para 3):**

Art Unit: 2128

1. minimizing the sum of difference square; 2. minimizing the sum of absolute differences; and 3.

minimizing maximum difference **(page 132)**; and

(E) defining the difference as the distance between field observed values and model simulated values

including flows and pressure head/water levels **(page 132)**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

26. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walters's "Calibration of water distribution network models using genetic algorithms".

As per claim 6, Walters discloses: The method of automatically calibrating a water distribution model as defined in claim 1 wherein said boundary conditions include pressures control valve settings and pump operation speeds **(page 139 last para; page 140 first para)**. Walters however does not expressly disclose that the boundary conditions include water storage tank levels. Official Notice is taken with respect to this limitation. It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the references in order to have a more detailed and realistic model that would encompass more variables on the boundary conditions. This motivation and feature is displayed in ATSDR's "Summary of Findings" **(page 2 para 1)**.

As per claim 17, Walters discloses: A method of calibrating a water distribution model including the steps of collecting calibration target data and matching for the calibration one or more of the following: pipe flows, pump flows, pressure at any location in a system **(Abstract, page 132 para 3; page 135 para 2 and last para)**; collecting calibration boundary condition data including, pump operation speed, and

Art Unit: 2128

link status (**page 135 para 3, page 136 para 3, page 137 para 3**); and including a time of day for both calibration target data and boundary condition data thus representing systematic conditions at that time, whereby a complete set of data is collected to represent the overall system conditions at any given time of day (**page 135 para 2 and last para**). Walters however does not expressly disclose that the calibration includes tank waters levels and fire hydrant test pressure and that collecting calibration boundary condition data including: reservoir water level, tank hydraulic head measurements, fire hydrant test flow, fire hydrant test time. Official Notice is taken with respect to these features. It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the references in order to have a more detailed and realistic model that would encompass more variables on the boundary conditions. This motivation and feature is displayed in ATSDR's "Summary of Findings" (**page 2 para 1**).

Allowable Subject Matter

27. Claims 2-3 would be allowable if rewritten to overcome the objections recited above, and rejection(s) under 35 U.S.C. 112, first and second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

27.1 The following is a statement of reasons for the indication of allowable subject matter:

The specific arrangement in combination as recited in the Claims is not expressly disclosed.

The most relevant prior-art of record is Walters's "Calibration of water distribution network models using genetic algorithms".

As per claim 2, Walters discloses all limitations of claim 1, and the following claim 2 limitations: (A) computing a goodness-of-fit value for each calibration solution (**page 133 para 3**). Walters further discusses an objective to find the solution that has the smallest overall difference between the model values and the observed values (**page 132**). Walters further discloses searching for optimized solutions using a genetic algorithm and calculating overall goodness of fit over the field data sets selected for a model calibration run, and assigning an overall goodness of fit to each solution as fitness entries into a genetic algorithm to search for optimized solutions (**page 132 para 3; generally, section 2.1**).

Art Unit: 2128

Walters however does not disclose the information emphasized: (A) computing a goodness-of-fit value for each calibration solution by using one or more of the following objective functions: 1. minimizing the sum of difference square; 2. minimizing the sum of absolute difference; 3. minimizing maximum difference; defining the difference as the distance between field observed values and model simulated values including flows and pressure head/water levels; and converting both flow differences and head level differences into an equivalent score using two conversion factors, including point per unit pressure head difference and point per unit flow difference; and (C) searching for optimized solutions using a genetic algorithm and calculating overall goodness of fit over the field data sets selected for a model calibration run, and assigning an overall goodness of fit to each solution as fitness entries into a genetic algorithm to search for optimized solutions.

27.2 The art of record, individually or in combination, fails to suggest or render obvious the specific arrangement of the claimed invention.

27.3 Claim 3 depends on claim 2 and is objected to for same reasoning as presented above.

28. Claims 10-14 and 18-21 would be allowable if rewritten or amended to overcome the objections recited above, and rejection(s) under 35 U.S.C. 112, first and second paragraph, set forth in this Office action.

28.1 The following is a statement of reasons for the indication of allowable subject matter:

As per claim 10, the specific arrangement in combination as recited in the Claims is not expressly disclosed. The most relevant prior art of record is Walters's "Calibration of water distribution network models using genetic algorithms". Walters discloses limitations (A), (B), and partly (D), **(page 133 para 2; Abstract; sections 2.1, 2.3, 3, 4.2, and 4.4)**. Walters however does not expressly recite or provide suggestion to combine the following highlighted limitations: A computer readable medium containing executable program instructions for automatically calibrating a water distribution model of a water distribution network that has links that include pipes and junctions, the executable program instructions comprising program instructions for:

(A) generating a graphic user interface by which the user may enter data concerning field observed

Art Unit: 2128

measurements for the network, and may make other entries and selections; (B) a calibration module formatted to produces calibration information for a water distribution model constructed from user-selected calibration parameters that include at least one of pipe roughness, junction demand information, including demand groups roughness groups, and link status; (C) a genetic algorithm module coupled to said calibration module and said user interface such that information about said calibration parameters, and user-entered field observed data, including selected field data sets that include calibration target data and boundary data, may be operated upon to produce a population of trial solutions and said graphic user interface being configured to allow a user to select goodness-of-fit criteria, a weighting functions, and more genetic algorithm parameters and a number of top trial solutions; and (D) a hydraulic network simulation module communicating with said genetic algorithm module such that top solutions generated by said genetic algorithm module can be run by said hydraulic network simulation module and saved to be used to predict actual behavior of said network.

28.2 The art of record, individually or in combination, fails to suggest or render obvious the specific arrangement of the claimed invention.

28.3 Claims 11-14 and 19-21 depend on claim 10 and are allowable for similar reasons as presented above.

Conclusion

29. All claims are rejected.

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

31. The Instant Application is not currently in condition for allowance.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from

Art Unit: 2128

the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Silver whose telephone number is (571) 272-8634. The examiner can normally be reached on Monday thru Friday, 10am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Silver
Patent Examiner
Art Unit 2128

/ds/

 HUGH JONES Ph.D.
PRIMARY PATENT EXAMINER
TECHNOLOGY CENTER 2100